APPENDIX K

SCOPING COMMENTS AND RESPONSES

The U.S. Department of Energy (DOE) announced its intent to prepare an environmental impact statement (EIS) on waste management activities for groundwater protection at the Savannah River Plant in the Federal Register on April 26, 1985. Interested parties were invited to submit written comments or suggestions for consideration in preparing the EIS during a 30-day public comment period that ended on May 28, 1985, or at two public scoping meetings.

During the public comment period, 16 individuals, agencies, and organizations presented written or oral comments; one individual provided written comments at one of the public scoping meetings and more detailed written comments after the meetings. Table K-1 lists the individuals, agencies, and organizations who provided comments.

Table K-2 presents the comments received at the scoping meetings or in writing during the public comment period. This table also provides DOE's responses to these comments.

Table K-3 summarizes the topics contained in the comments and references the appropriate chapters and sections of this EIS.

At the public scoping meetings, DOE presentations inadvertently referred to the alternative of aboveground disposal as "greater confinement disposal facilities." Greater confinement disposal is an in-ground disposal concept, and the summary of this EIS contains a brief correction of this inadvertent statement.

Table K-1. Agencies, Organizations, and Individuals Submitting Scoping Comments

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response

STATEMENT OF FRANCES HART
Energy Research Foundation
2530 Devine St.
Columbia, SC 29205

Waste Management Activities for Groundwater Protection
at the Savannah River Plant, Aiken, South Carolina

Scoping Comments on the Preparation of
an Environmental Impact Statement

Aiken, South Carolina
May 14, 1985

Energy Research Foundation
2530 Devine Street
Columbia, South Carolina 29205

Natural Resources Defense Council
1350 New York Avenue, NW
Washington, D.C. 20005

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
	I am Frances Hart and I represent the Energy Research Foundation. We appreciate the opportunity to present suggestions for the scope of an Environmental Impact Statement on hazardous waste management at the Savannah River Plant and we commend the Department of Energy for voluntarily undertaking this assessment.	
A-1	Before making specific comments, however, we would like to stress the need to view this process within the context of national and state laws regulating hazardous wastes. DOE must make it clear that any selection of alternatives is limited by existing regulatory requirements under the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation and Liability Act (Superfund), and other federal laws; by South Carolina's Hazardous Waste Management regulations and the South Carolina Pollution Control Act; and by SRP's own commitments.	All alternatives considered in the EIS are assessed in relation to applicable regulations and standards. Chapter 6 discusses the applicable regulatory requirements associated with the alternatives, including DOE Orders and the Resource Conservation and Recovery Act, as amended.
A-2	The NEPA process cannot and must not be used to circumvent these requirements, nor may required actions be delayed pending completion of the EIS.	If NEPA requirements conflict with other applicable statutes, Chapters 1 and 6 of the EIS will discuss the conflicts.
A-3	Thus, there are no alternatives for closure and remedial action at RCRA sites other than those specified in the statute and applicable regulations. CERCLA sites will be subject to the same cleanup standards as commercial sites. For other sites, such as low-level radioactive waste sites with no hazardous waste contamination, SRP would be guided by the ALARA principle and its own requirements and commitments towards alternatives to shallow land burial, such as engineered above-ground storage and other state-of-the-art technology. Many of our specific comments are, therefore, stated in terms of compliance with these pertinent regulations. We would expect that any Environmental Impact Statement would include, first of all, a background description consisting of at least the following elements:	See the response to comment A-1.
A-4	1. A section describing all applicable laws, regulations and orders, and potential future requirements; including RCRA, as amended, Superfund Reauthorization bills, Clean Air and Water Acts, Safe Drinking Water Act, OSHA, Atomic Energy Act, EPA radiation standards, and DOE Order 5820.	See the response to comment A-1. The EIS discusses the status, intent, and potential applicability of regulations that are required under the 1984 RCRA amendments, even though they might not be finalized or issued.

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
A-5	2. A characterization of the existing environment including a detailed discussion of SRP geology, hydrology, seismicity, local climate and meteorology, and so on. This description should include a detailed discussion of SRP groundwater characteristics, including interconnection of aquifers and connection of contaminated aquifers with surface streams flowing offsite. All environmental studies by outside contractors, universities, and researchers should be referenced.	Chapter 3 and Appendixes A and B of the EIS discuss and characterize the existing environment. Chapter 5 discusses environmental studies and monitoring programs within the scope of the EIS. Appendix A describes the geology and subsurface hydrology of the SRP, including the relationship of groundwater to surface water. Documents used to prepare Appendixes A and B are referenced.
	3. A characterization of existing waste generation and treatment should include:	
A-6	a) a brief history including types and amounts of hazardous, low-level, and mixed wastes previously generated;	Appendix B of the EIS discusses previously generated wastes contained in existing hazardous, low-level radioactive, and mixed waste sites.
A-7	b) a detailed description of types and amounts of hazardous, low-level, and mixed wastes currently generated at SRP, including wastes discharged to air, surface waters, land, groundwater, TSD facilities, and shipped offsite;	Chapters 2 and 4 of the EIS discuss the quantities and characteristics of hazardous, low-level radioactive, and mixed wastes from ongoing and planned SRP operations, wastes in storage, and wastes from remedial and closure actions requiring disposal. A description of all releases and effluents that are currently generated and not related to the protection of groundwater resources is outside the scope of this EIS; however, these releases are discussed in U.S. Department of Energy Savannah River Plant Environmental Report for 1984 (DPSPU 85-30-1).
A-8	c) anticipated changes in types or amounts of hazardous, low-level, and mixed wastes to be generated in the future;	Chapters 2 and 4 discuss major assumptions on changes in the types or amounts of waste requiring disposal.
A-9	d) programs underway to reduce or eliminate the generation of wastes as expeditiously as possible, as required by RCRA;	Chapters 2 and 4 and Appendix D discuss predisposal technologies to reduce volume, solidify/stabilize, treat, and control hazardous, low-level radioactive, and mixed wastes. Waste minimization permitting requirements of RCRA are discussed in Chapter 6; however, as required by RCRA, waste minimization programs are continuing efforts at the SRP and are not specific alternatives for remedial actions or for other actions that are within the scope of this EIS.

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
A-10	e) steps taken by SRP to encourage process substitution, materials recovery, properly conducted recycling, reuse and treatment, as required by RCRA;	See the response to comment A-9.
A-11	f) results of previous studies and steps taken to reduce the volume of wastes generated at SRP, including incineration and compaction;	See the response to comment A-9.
A-12	g) results of any studies undertaken or programs underway to separate mixed wastes into hazardous and radioactive components;	There are no current programs or studies for separating mixed wastes into separate hazardous and low-level radioactive components.
A-13	h) compliance with RCRA hazardous waste generator requirements and applicable DOE regulations;	Chapter 6 summarizes applicable RCRA requirements for waste generators and associated DOE Orders and regulations.
A-14	i) provide to the greatest extent possible the information required by the Hazardous Substances Inventory section of the Superfund Improvement Act of 1985.	Appendix B characterizes existing hazardous, low-level radioactive, and mixed waste sites. Appendix B also discusses the history of waste disposal, evidence of past and existing contamination, and waste characteristics. Also see the response to comment A-1.
A-15	4. Describe the types, amounts, and source or destination of hazardous, low-level, or mixed wastes, if any, that are transported onsite and offsite. Discuss compliance with RCRA and DOE transportation requirements. Discuss any past accidental releases during transportation.	The final EIS for waste management operations at the SRP (ERDA-1537) discusses the transport of waste materials. Chapter 6 of this EIS discusses applicable regulatory requirements for the transport of waste material that might be associated with proposed actions and alternatives. Also see Chapter 4.
	5. A characterization of current waste storage should include:	
A-16	a) a description of the location and contents of all SRP storage facilities for hazardous, low-level, or mixed wastes, including idle production facilities and underground storage tanks;	The EIS describes the characteristics and amounts of wastes in storage requiring disposal in Chapters 2 and 4. Existing storage facilities and idle production facilities are outside the scope of this EIS.
A-17	b) anticipated changes in types and amounts of hazardous, low-level, and mixed wastes to be stored at SRP, or in the number or location of storage facilities, in the future;	Anticipated changes in the amounts of hazardous, low-level radioactive, and mixed wastes requiring disposal are considered in Chapters 2 and 4. These sections also describe new retrievable-storage facilities for disposal of hazardous, low-level radioactive, and mixed wastes that have not been approved and permitted.

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
A-18	c) discuss DOE's alternative storage plans if storage of these wastes is prohibited under section 201(j) of the 1984 RCRA amendments;	The EIS considers only those new retrievable-storage facilities that comply with applicable Federal and State requirements, as currently defined. See Chapter 6.
A-19	d) discuss implications and plans for compliance with 1984 RCRA amendments concerning underground storage tanks.	Compliance of new retrievable-storage facilities with applicable Federal and State regulatory requirements is discussed in Chapters 4 and 6.
	6. A characterization of current waste disposal at SRP should include:	
A-20	a) a complete description of all SRP past and present disposal facilities for hazardous, low-level, and mixed wastes, including size, location, and type of facility, type and amount of waste disposed of, source of each type of waste disposed, date on which each type of waste was placed in facility, and date - if any - on which waste disposal ceased;	Appendix B and its referenced documents present the pertinent characteristics of existing hazardous, low-level radioactive, and mixed waste sites, including location, history of waste disposal, past and existing contamination, and characterization of disposed wastes.
A-21	b) discuss whether and to what extent SRP facilities have been used to dispose of waste generated offsite.	Chapters 2 and 4 discuss waste material for disposal on the SRP that is generated offsite.
	The Environmental Impact Statement should include detailed descriptions of environmental effects of past and current waste management activities at SRP including the following:	
A-22	1. Complete information and monitoring data regarding past waste releases from all waste generating, transporting, treatment, storage, and disposal facilities, including dates of releases, amount and toxicity of waste released, extent and nature of environmental contamination, extent to which release is continuing, and all other information required by Section 244 of the 1984 RCRA amendments.	See the responses to comments A-7 and A-20. The EIS considers existing hazardous, low-level radioactive, and mixed waste sites, regardless of whether they are defined as "continuing release" sites.

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
A-23	2. Detailed discussion of effects of each release on groundwater, surface streams, air, vegetation, wildlife, health and safety of workers, and public health and safety. Include the extent to which release has traveled or has the potential to travel offsite. Several of the streams at SRP dissect aquifers known to be contaminated; these aquifers are discharging to streams and the material is being carried offsite.	Chapters 2 and 4 and Appendixes F through I discuss the environmental consequences and the methods for assessing the environmental consequences of the proposed action and alternatives. Also see the responses to comments A-7 and A-20.
A-24	3. Detailed discussion of maximum cumulative environmental effects which could be caused by such releases; assessment must include the following: a) a detailed description of background (i.e., not affected by any SRP operations) concentrations in all media for all actual and suspected pollutants, and current distributions from chronic releases from point sources and nonpoint sources in all media for all pollutants. b) impacts to vegetation including but not limited to pollutant concentrations in specific tissues from root uptake and absorption from the atmosphere; changes in vegetation distribution resulting from pollutants; changes in physiologic processes (e.g., growth, carbon fixation, reproductive effort and success) resulting from pollutants; physical effects (e.g., chlorosis, growth reduction) resulting from pollutants; c) impacts to animals including but not limited to pollutant concentrations in specific tissues from bio-accumulation and inhalation; changes in physiologic processes (e.g., growth, reproductive effort and success) resulting from pollutants; physical effects (e.g., hair loss, teratogenic effects) from pollutants;	Cumulative environmental effects of the proposed action and alternatives are discussed in Section 4.7. Chapter 3 and Appendixes A and B describe the existing SRP environment, including current impacts from prior hazardous, low-level radioactive, and mixed waste management practices.

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
	d) impacts to ecosystems including but not limited to changes in habitat structure that limit or change floral/faunal distributions; changes in energy flow that might effect floral/faunal distributions, both immediate and delayed; changes that might affect the species composition of communities;	
	e) maximum health effects that could be caused by such releases, including the uncertainties involved in each calculation;	
	f) compare the releases, doses and levels of contamination discussed above with standards found in DOE orders, the Clean Water Act, the Clean Air Act, the Safe Drinking Water Act, EPA standards, and other applicable standards.	
A-25	4. Detailed discussion of any studies or programs underway or planned to obtain more data on past releases, including groundwater monitoring programs, placement of new wells, and so on.	Chapter 5 discusses ongoing and planned monitoring programs and studies related to the proposed action and alternatives.
A-26	5. Provide for all pollutants literature, data, or experimental toxicological data to support predicted impacts to terrestrial and aquatic flora and fauna, including estimates of accuracy and precision for predicted impacts.	Chapter 4 and its referenced documents describes the methods and assumptions related to the assessment of health effects from radiological and nonradiological releases.
A-27	6. Any facility which must obtain any types of hazardous waste permit must include in the permit application provisions for corrective action for all prior releases of hazardous waste from any waste management facilities, as required by Sections 206 and 207 of the 1984 RCRA amendments. This means that SRP must provide plans for corrective action for all of the CERCLA sites, requiring the installation of groundwater monitoring systems, development of cleanup plans, and so on. At SRP, with a total of 153 identified waste sites, this will be a major undertaking. Discuss SRP's plans for compliance.	Chapters 2 and 4 of the EIS assess alternative remedial and closure actions at existing hazardous, low-level radioactive, and mixed waste sites. Based on the Record of Decision to be prepared on this EIS, the alternatives selected for implementation will be defined in detail when the required permit applications are made, before implementation of the proposed action. Not all of the 153 waste sites identified on the SRP contain hazardous, low-level radioactive, and mixed wastes.

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
A-28	7. The atmospheric distribution (micro and macroscale) of volatile organic compounds such as solvents must be addressed. EPA is currently undertaking the development of air standards for VOC including the compounds historically and currently used at SRP. Regulations will cover emissions from point as well as nonpoint sources (e.g., lagoons, rivers, and sewage and waste treatment facilities, and irrigation systems). Portable gas chromotographs employed with a sound sampling plan can adequately describe existing atmospheric distributions of VOC's. Meteorological models validated internally and calibrated to the SRP region, must be employed for macroscale distributions.	Ambient air quality and meteorological parameters are discussed in Chapter 3. Atmospheric releases of nonradioactive substance due to alternative remedial and closure actions for waste sites considered in the EIS are discussed throughout Chapter 4.
A-29	8. Discuss any response, corrective, or closure activities undertaken at any of these facilities.	Chapter 1 discusses programs and projects for corrective action and closure that have been approved or permitted on the SRP.
	The Environmental Impact Statement discussion of current waste management and disposal activities at SRP should include the following as well:	
A-30	1. Discuss compliance with RCRA at all SRP hazardous and mixed waste facilities, including:	Chapter 6 discusses the applicable Federal and State requirements, including permits for the proposed action and alternatives considered in the EIS.
	a) M-, F-, and H-Areas seepage basins;	
	b) CMP pits;	
	c) the old TNX basin, which must be closed as a RCRA 265 unit;	
	d) the new TNX basin, whose contents appear to include mercury, methylene chloride and other listed solvents and so must be included in SRP's Part B application and RCRA groundwater monitoring requirements;	
	e) the Savannah River Lab seepage basins, which received waste after July 26, 1982, and so must be included in the Part B application and RCRA groundwater monitoring requirements;	

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
	f) the L-Area Oil and Chemical Basin which has been inactive but not closed, and so must be included in the Part B application and RCRA groundater monitoring requirements;	
	g) the Metallurgical Lab basin and overflow seepage depressions;	
	h) the underground storage tanks, waste oil trenches and other hazardous waste landfill trenches at the low-level waste burial ground;	
	i) the Ford Building seepage basin and waste site;	
	j) the 716-A Motor Shop seepage basin;	
	k) the Experimental Sewage Sludge application sites;	
	l) acid/caustic basins;	
	m) burning and rubble pits;	
	n) coal pile runoff containment basins.	
A-31	2. Discuss compliance with groundwater assessment requirements of RCRA at all applicable facilities, including M, F, and H Areas. The discussion of compliance must demonstrate in detail that SRP's groundwater monitoring system meets the following RCRA requirements:	Chapter 5 discusses the SRP groundwater quality assessment plan.
	a) minimum of one upgradient and three downgradient monitoring wells;	
	b) wells must monitor the uppermost aquifer;	

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
	c) downgradient wells must be placed in a position to immediately detect migration of statistically signficant amounts of hazardous waste or hazardous waste constituents to the uppermost aquifer; wells placed more than a few feet from the impoundment cannot meet this requirement of immediate detection; d) wells must be analyzed for parameters specified in 265.92(6) and according to a specified schedule; e) If groundwater contamination is detected, a formal and detailed groundwater quality assessment plan to identify the rate and extent of contamination must be implemented. Regulations require that within 15 days of the detection of a statistically significant difference, a specific plan be submitted which includes: 1) number, location, and depth of any new wells; 2) sampling and analytical methods to be used; 3) criteria to be used in evaluating the data; 4) schedule for implementation 5) certification by a qualified geologist or geotechnical engineer. The discussion of compliance should also take into account the following:	
A-32	a) There are many monitoring wells at SRP, but there is little available information about construction techniques and materials. Details regarding construction and also precise sampling locations, methods of selecting locations, sampling procedures and preservation techniques need to be specified to	See the response to comment A-31.

Table K-2. Scoping Comments and DOE Responses

Comment number		Comment	Response
		demonstrate conformity with RCRA. Site geology is complex but it appears that almost all basins are underlain by several interconnected aquifers, making the use of cluster wells necessary.	
A-33	b)	SRP must do Appendix VIII analyses yearly at all areas which display groundwater contamination. There is some indication at several of the basins, according to the Technical Summary of Groundwater Protection Plan, that contamination from substances which were supposedly never placed in the basins is occurring. This, and the fact that there seems to have been a lack of control and recordkeeping regarding disposal practices in the past, make Appendix VIII analyses at all regulated areas crucial. SRP Types A, B, C, D, and E analyses collectively do not contain all the Appendix VIII compounds.	See the responses to comments A-30 and A-31.
A-34	c)	Seepage basins at F and H Areas receive or have received wastewater hazardous because of low pH and contamination by mercury or chrome. Two of the basins are inactive and should be listed as CERCLA sites. The active basins must receive a hazardous waste storage permit. Because groundwater contamination from the active pits has been detected, the issuance of a storage permit to these surface impoundments does not seem justified, and a groundwater assessment program as specified under RCRA should already have been implemented.	Chapters 2 and 4 discuss alternative remedial and closure actions for existing waste sites, including the F- and H-Area seepage basins. Also see the response to comment A-30.
A-35	d)	At a RCRA facility the closure performance standard and the spill cleanup and groundwater cleanup standards require the removal of all waste. Thus any inorganic or organic constituent in total concentration above background should be removed. The level of existing contamination at SRP is not relevant to this demand, nor is there any kind of special status or exemption afforded any facility in meeting this demand.	Both Federal and State hazardous waste regulations call for either the removal of waste or closure without removal. Each of these alternatives will be assessed for existing hazardous, low-level radioactive, and mixed waste sites.

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
A-36	e) A discussion of M-Area compliance with closure standards must include the following: 1) There are essentially seven hazardous waste units to consider: - the M-Area settling basin - the pipeline from process buildings to the basin - the natural seepage area - the overflow from M-basin to the seepage area - Lost Lake - the overflow from the seepage area-to Lost Lake - the sewer lines from the process buildings to Tim's Branch 2) The solvent storage tanks behind Buildings 313M and 321M have leaked organic solvents into the ground and should be considered a RCRA facility. 3) The M-basin has received effluents which are hazardous because of low pH and contamination by mercury, cadmium, chrome, and lead. The effluent also contains large quantities of listed solvents. Thus the waste would require more than control of pH alone to be classified as non-hazardous. 4) The treatment of contaminated groundwater by an airstripping unit should only be done in accordance with a hazardous waste treatment permit, and upon proper certification that this alternative is the preferred one. Remedial actions such as air-stripping of organic compounds from contaminated groundwater must address micro and macro-scale	Chapter 1 discusses those approved or permitted actions being taken at M-Area for which separate NEPA documentation has been prepared. Also see the response to comment A-30.

Table K-2. Scoping Comments and DOE Responses

Comment number		Comment	Response
		atmospheric distributions as well as runoff to nearby streams and recontamination of soils by VOCs returned to earth in precipitation and settling.	
		5) The basin must receive a permit and cannot be closed until a permit is issued.	
		6) Placing waste generated from cleanup of Lost Lake, seepage areas, etc., into the basin is totally unacceptable. If any other material has to be excavated, it should be placed in a secure RCRA facility. If the other waste is left in place, these areas should also be considered regulated units requiring post-closure care.	
A-37	f)	There is a specific ban on construction of new hazardous waste facilities without prior issuance of a permit. Since the average time to issue a hazardous waste permit is two years, and no construction activity can begin until a permit is issued, discuss how this requirement will affect SRP's plans and implementation schedules for additional facilities.	See the response to comment A-30.
A-38	g)	Discuss SRP compliance with relevant commitments made during the L-Reactor NEPA process.	Chapter 1 discusses the commitments made in the L-Reactor EIS.
A-39	h)	Discuss SRP compliance with EPA requests made in connection with its review of the L-Reactor EIS, including its request that DOE expedite the decommissioning of the low-level waste burial ground; that it halt the discharge of disassembly basin purge water to seepage basins; and that state-of-the-art disposal techniques be substituted in both instances.	EPA comments submitted on the draft EIS for the restart of L-Reactor were addressed in Volume 3 of the final EIS (DOE/EIS-0108).
A-40	i)	Discuss plans for alternative storage and disposal techniques if certain types of waste are banned from land disposal under Section 201 of the 1984 RCRA amendments.	See the response to comment A-18.

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
A-41	j) Discuss plans to retrofit existing surface impoundments within the next four years to meet the minimum technological requirements of the 1984 RCRA amendments, including double liners and leachate collection systems.	DOE will comply with applicable portions of the Resource Conservation and Recovery Act, as amended, including the minimum technological requirements for and closure of land disposal facilities. Also see the response to comment A-1.
A-42	k) Discuss plans to comply with the requirement, effective September 1, that all facility owners or operators must certify that a program is in place to reduce volume and/or toxicity of waste to the degree economically feasible; for example, how SRP will conform to the same standards in this regard as other aluminum extrusion facilities do.	See the response to comment A-9.
A-43	l) Discuss plans to comply with the requirement, also effective September 1, that a generator must certify that the treatment or disposal method used is the best and most practical currently available method which will minimize current and future threats to human health and the environment.	See the response to comment A-9.
A-44	m) Discuss plans to comply with the requirement that the Part B application contain a certification that the facility is in compliance with all applicable groundwater monitoring and financial responsibility requirements.	See the response to comment A-30. DOE will meet specific and applicable requirements of Part B applications as part of the permitting process for facilities. Federal facilities are exempt from the financial responsibility requirements of RCRA.
A-45	Possible environmental impacts and cumulative impacts of all proposed actions must be described in detail, including estimated changes in concentrations and distributions of pollutants in all media for all proposed actions.	Chapter 4 discusses the environmental consequences of the proposed action and alternatives and cumulative environmental effects.
A-46	The Environmental Impact Statement should describe all energy and resource commitments as follows: 1. present for all alternatives in comparable units budgets of energy and resources committed to construction, operation and maintenance; 2. provide detailed documentation to support unit value assignments and conversion factors to comparable units;	Section 4.9 discusses environmental impacts that cannot be avoided or that are irreversible for each of the categories of alternatives considered in the EIS, including energy and resource commitments.

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
	3. provide estimates of accuracy and precision by which total commitments for each alternative can be evaluated and compared.	
A-47	I will close with two final comments. First, although "source, special nuclear, and byproduct materials" which are regulated by the Atomic Energy Act are exempt from RCRA, the AEA definition of these materials is very narrow, and does not include the hazardous wastes with which these AEA materials may be associated. The AEA contains no provisions for managing hazardous wastes, nor does it authorize DOE to regulate these mixed wastes. Mixed wastes should be regulated according to the requirements of both RCRA and the AEA. Where RCRA regulations overlap with the AEA, the more stringent standard should prevail. In the rare case where compliance with both sets of requirements is physically impossible, the burden should be on DOE to demonstrate the inapplicability of RCRA.	See the response to comment A-30. Chapter 6 discusses the status and applicability of mixed waste rulemaking.
A-48	Finally, the Federal Water Pollution Control Act explicitly requires DOE to comply with all state laws "respecting the control and abatement of water pollution in the same manner and to the same extent as any non-governmental entity." This requires compliance with all state water pollution requirements, including groundwater pollution. Formal authority over monitoring and control of all sources is necessary if South Carolina's responsible agency, the Department of Health and Environmental Control, is to address the SRP waste management and groundwater contamination problem in the comprehensive manner demanded by the South Carolina Pollution Control Act. Thank you.	On April 8, 1985, DOE and the South Carolina Department of Health and Environmental Control entered into a Memorandum of Agreement to cooperate mutually in ensuring the environmental quality on the SRP. As stated in this memorandum, DOE will comply with specific environmental acts of the State of South Carolina. Also see the response to comment A-30.

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response

STATEMENT OF W. F. LAWLESS
Assistant Professor of Mathematics
Paine College

SCOPING COMMENTS CONCERNING SAVANNAH RIVER PLANT
WASTE MANAGEMENT ACTIVITIES
ENVIRONMENTAL IMPACT STATEMENT

by

W. F. Lawless

Assistant Professor of Mathematics

Paine College

May 28, 1985

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
	INTRODUCTION	
	The Department of Energy (DOE) has initiated comments and suggestions to assist in identifying environmental issues and the scope of an environmental impact statement (EIS) on waste management activities for groundwater protection at the Savannah River Plant (SRP). Public comments are to be considered in the preparation of an EIS. An April 29, 1985 DOE news release identified the DOE intent to prepare such an EIS and included background information on the SRP; the DOE news release also included alternatives for treating waste sites, for building new waste disposal facilities, and for discharging reactor basin purge water, plus the non-inclusive listing of SRP environmental issues (1).	
	The comments herein were delivered in draft at the first DOE scoping meeting, held at the H. Odell Weeks Activity Center in Aiken, SC, May 14, 1985.	
	General Comments	
B-1	1. Savannah River Plant Seepage Basins In August 1983, a hotline complaint was filed with the DOE Inspector General charging the DOE with willfully avoiding its public responsibility to prepare an EIS for the new DOE Order 5820.2, Radioactive Waste Management (2,3). Such an EIS has not been written, but one is now planned for SRP groundwater protection waste management activities (1). The Department of Energy is to be congratulated on this very important and forthright action. It is hoped that similar actions will take place at all DOE sites throughout the nation. The new EIS planned for the Savannah River Plant will speak volumes on the inadequacies of DOE Order 5820.2, a regulation that is a mockery of American technology and epitomizes the mishandling of radioactive and hazardous wastes by the DOE bureaucracy. The new EIS will begin to correct the groundwater damage done by the DOE's use of seepage basins at SRP, basins still allowed by DOE Order 5820.2.	Chapter 6 discusses the applicable Federal and State regulatory requirements for the proposed modification of waste management activities at the SRP, including the requirements of the Resource Conservation and Recovery Act, as amended, and DOE Orders. A NEPA assessment of DOE Order 5820.2 is outside the scope of this EIS.

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
B-2	The SRP is cleaning up one of its 68 liquid waste seepage basins, the M-Area seepage basin (4). The General Accounting Office (GAO) has estimated that the M-Area seepage basin clean-up will cost up to $64 million or more (4), yet the Savannah River Plant will be using a seepage basin when the L-Reactor comes on line in 1985 (5). The new EIS should carefully detail what seepage basins will continue to be used at the Savannah River Plant and for how long, the contaminants to be disposed of and where, the estimated contaminant build-up at each basin, the basins that are clogged to further seepage and are overflowing, the current estimated clean-up cost for each basin, and the rationale for each basin's continued use.	Chapters 2 and 4 and Appendix F discuss remedial and closure actions at hazardous, low-level radioactive, and mixed waste sites. Appendix B characterizes each of the waste sites considered. Chapters 2 and 4 and Appendix G discuss new disposal facility alternatives for hazardous, low-level radioactive, and mixed waste, including waste material from remedial and closure actions at existing waste sites. Chapters 2 and 4 discuss alternatives to the continued use of seepage basins for the discharge of disassembly-basin purge water from C-, K-, and P-Reactors.
B-3	Seepage basins are one of the sources of hazardous and radioactive waste contamination of migratory fowl and animals at the SRP (6). Contaminated animals have been known to leave the Savannah River Plant site (6). The new EIS should quantify this phenomenon by detailing how each basin has possibly contributed to this means of spreading contamination, and to where with what extent. The new EIS should review the steps SRP has taken to prevent the spread of hazardous and radioactive contamination via water fowl and animals from each one of the 68 known seepage basins.	The Operating Contractor has developed a Program for Management of Contaminated Wildlife at the Savannah River Plant, which identifies and monitors potential human exposure pathways to wildlife contaminated by hazardous and radioactive substances. The locations, contaminants, and descriptions of those areas of potential contamination are contained in various reports (DPSP-83-1008, DPSP-84-1054, DSPS-84-1051, and DPSPU-84-302). Procedures followed in the wildlife monitoring program are contained in DPSOP 271.1. Chapter 4 of the EIS assesses the environmental consequences of the proposed modifications to waste management activities at the SRP, including impacts to aquatic and terrestrial biota and potential health effects from radiological releases that take into account known major pathways of exposure.

Table K-2. Scoping Comments and DOE Responses

Comment number	Comment	Response
	2. Waste Management Practices. The DOE Intent to Prepare an Environmental Impact Statement (1) states that a 1977 EIS on the SRP "...resulted in the implementation of a waste management practices improvement program in accordance with	
B-4	DOE policies and standards." This 1977 EIS (ERDA 1537) included many important predictions that have not been publicly assessed by the DOE and should be assessed in the new EIS (8). Many of these predictions have proven wrong, e.g., on the levels of contamination entering the groundwaters underlying the SRP radioactive waste burial grounds and the radioactive and hazardous waste seepage basins, and on how well protected the Tuscaloosa aquifer was from contaminated groundwaters above the Tuscaloosa aquifer (5, 6, 7, 8).	Chapter 3, Appendix A, Appendixes F through I, and references in the EIS document all major assumptions and predictions related to the assessment of environmental consequences of the proposed modifications to waste management activities.
	The SRP publishes annual monitoring reports on radioactive and hazardous contamination at and off the SRP (e.g., reference	
B-5	6). The new EIS should not only assess the correctness of ERDA 1537, but should as well analyze the monitoring reports from 1977 to the present. Special attention should be directed to DOE excess releases on and off the SRP. For instance,	The EIS uses the results of SRP monitoring programs in characterizing and assessing the environmental consequences of the proposed modifications of waste management activities. Also see the response to comment B-4.
B-6	a) strontium-90 released from the F-Area seepage basins has been found to be at a groundwater concentration over eight (8) times the DOE Concentration Guides, or over 40,000 times the EPA drinking water standard, yet no reprimand has been given to Du Pont, the prime SRP contractor, because of this excess. The new EIS should detail every instance where the DOE Concentration Guides have been exceeded, what corrective actions have been taken and with what long-term effects.	Chapters 2 and 4 and Appendix F discuss remedial and closure actions at existing waste sites, including the F-Area seepage basins.
B-7	b) The annual off plant SRP monitoring reports indicate that strontium-90 in milk samples collected from around the SRP are within ranges found by the Environmental Protection Agency (EPA) (9). In a 1984 report, the EPA collected its own milk sample near the SRP and confirmed by their analysis that strontium-90 in milk samples drawn from near the SRP are not significantly different from other milk	Chapter 4 presents the radiological impacts from proposed remedial and closure actions at existing waste sites, including the potential radiological doses due to atmospheric releases.

Table K-2. Scoping Comments and DOE Responses

Comment number		Comment	Response
		samples from the southeastern U.S (10). However, the EPA apparently did not review the SRP annual monitoring data on strontium-90 in milk. That data, collected by the Savannah River Plant, indicates that the mean strontium-90 milk concentrations, along certain wind paths, are significantly greater than the mean concentrations in southeastern U.S. milk data as published by the EPA (11). One source of the strontium-90 in milk from around the SRP may be the airborne resuspension from seepage basin releases.	
B-8	3.	Waste Management Assessments The SRP waste management practices improvement program that started with the 1977 EIS (ERDA 1537), as announced in the DOE intent to prepare the new EIS, was stated to also include regular assessments and improvements to SRP waste management programs (1). A listing of all waste management assessments, including appraisals with findings and recommendations, since 1977 should be a part of the new EIS. For instance, the 1982 Savannah River Plant radioactive low level waste burial ground management appraisal report, not published by DOE, should be included (13). This appraisal report was highly critical of DuPont's management of the SRP radioactive waste burial grounds, but not having been finalized nor transmitted to DuPont, the appraisal report became the subject of a separate hot line complaint to the DOE Inspector General (12, 13). The result of that hot line complaint and a subsequent re-appraisal as directed by the DOE Inspector General, has been to dramatically transform operations at the SRP burial grounds (22).	Chapters 2 and 4 and Appendix G identify remedial and closure actions for the low-level radioactive burial ground. Appendix B also characterizes the burial ground.
B-9		The burial ground management appraisal report did not assess SRP seepage basins, but a 1982 radioactive high-level waste tank farm appraisal report attempted to do so and attempted to assess the long-term impacts seepage basins would have on the SRP groundwater environment (14, 15). However, that part of the high-level waste tank farm appraisal report was stopped by DOE management (12), but in effect, part of that long-term appraisal will be assessed in the new Waste Management Activities EIS. The scope of the original long-term appraisal of the high-level waste tank farms appears to have been more far reaching than the	The purpose of this EIS is to assess the proposed modifications of waste management activities at the SRP for hazardous, low-level radioactive, and mixed wastes. A discussion of high-level waste management activities is outside the scope of the EIS. The impacts of high-level waste management activities at the SRP were discussed in DOE/EIS-0062.

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		scope of the new EIS (15); the latter's scope should be expanded to cover all sources of SRP groundwater contamination, including the SRP high level radioactive waste tank farm and the Defense Waste Production facility (DWPF).	
B-10	4.	DOE Concentration Guides As stated in the recent DOE news release (1), the DOE wants "...to ensure continued protection of groundwater, human health and the environment." However, numerous instances have occurred at SRP where concentrations of radionuclides have exceeded the DOE Concentration Guides (16, p. 25, Table D; 17). Yet, the DOE apparently does not take steps to bring releases into the environment below levels established by these DOE Concentration Guides, nor has the DOE cited the SRP contractor when the Concentration Guides have been exceeded (18). This appears to be incongruent with DOE policy. For example, the 1984 L-Reactor EIS reported that strontium-90 groundwater concentrations from F-Area seepage basins reached 340,000 pCi/L (5). This level of strontium-90 is 42,500 times greater than the EPA drinking water standard and over 8 times higher than the DOE Concentration Guides (16, 17). When this was discussed with DOE, the DOE responded that the contractor was under no obligation to meet the DOE Concentration Guide for strontium-90 in groundwater (19). Putting aside, for the moment, the question of whether the DOE Concentration Guides themselves provide satisfactory protection to human health and the environment, exceeding those DOE Concentration Guides assuredly cannot protect anything. Since the DOE still self-regulates nuclear wastes, it would appear that these DOE Concentration Guides afford both the DOE and the prime contractor a cozy relationship. The new EIS should question the efficacy of these DOE Concentration Guides and whether, in the best interests of the public, these guidelines should be replaced with regulations that bite.	See the response to comment B-6. Chapter 6 discusses the applicable Federal and State regulatory requirements for the proposed modifications of waste management activities, including DOE Orders.

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Comment number	Comment	Response
	In 1984, the federal court removed the DOE's right to self regulate hazardous chemical wastes (4) after the largest industrial spill of mercury occurred at the DOE Oak Ridge facility (20, 21). The new EIS is a good, first step forward for the DOE to recoup lost credibility, but it must be strongly reinforced with a cost-efficient, professional operation that cleans up the SRP environment and keeps it clean. The DOE can ill afford another cover-up.	
B-11	5. Remedial Action Programs The M-Area remedial action program to manage and control existing groundwater contamination was included in the L-Reactor EIS (5), but it has not been central to the subject of an EIS until now, yet corrective action alternatives to the M-Area basin clean up apparently do not exist because remediation has already begun (4, 5). The new EIS is a fine idea, but it comes after the fact for deciding the appropriate course of action for the M-Area seepage basin clean-up, and for allowing public input into that decision, unless, with the new EIS, the DOE is now offering the public this opportunity. The M-Area seepage basin clean-up will jettison an estimated 30 tons per year of chlorinated hydrocarbons into the atmosphere at one of the most populated work areas on the SRP plant site (4, 5). It is appropriate that the public have the right to question the Savannah River Plant scientists and engineers on the decision to allow airborne releases of these potentially hazardous chemicals within the SRP manufacturing and administration areas.	As stated at the public scoping meetings, approved and permitted remedial actions are currently underway in M-Area (i.e., operation of an air stripper and the construction and operation of an effluent treatment facility to discontinue use of the M-Area seepage basin). These actions, taken pursuant to Public Law 98-181, are discussed in Chapter 1 of the EIS. Because these actions have been approved previously and a separate NEPA review has been performed, these actions are not considered in detail in the EIS. The EIS considers the disposal of the sludge from the M-Area effluent treatment facility. Operation of the air stripper meets all applicable air-quality standards, and its operation has been permitted by the South Carolina Department of Health and Environmental Control.
B-12	The SRP Groundwater Quality Protection Program discussed the removal of highly contaminated soil and chemical and pesticide hazardous waste from the CMP seepage basins for transport, storage and disposal elsewhere (7). This remedial action should similarly be a apart of the new EIS, especially if highly contaminated wastes will be transported and disposed offsite the SRP plant site.	Chapter 1 discusses the removal of waste material from the CMP pits. Disposal of the waste material, currently in a permitted hazardous waste storage building, is considered as part of the material requiring disposal at new onsite disposal facilities, to be assessed in Chapter 4 of the EIS.

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Comment number	Comment	Response
	Specific Comments	
B-13	1. The 1983 technical summary document, The Technical Summary of Groundwater Quality Protection Program at Savannah River Plant, Volumes I and II, should be up-dated and corrected where necessary. For instance, the M-Area seepage basin is listed as non-radioactive instead of as a mixed waste basin.	The EIS will use the most current data available.
	References	
	1. U.S. DOE news release, Department of Energy Announces Scoping Meetings Concerning Waste Management Activities EIS, April 29, 1985. The news release included as an attachment, the Department of Energy Waste Management Activities for Groundwater Protection at the Savannah River Plant, Aiken, SC: Intent to Prepare an Environmental Impact Statement.	
	2. Letter to C. Benge, Inspector, DOE Inspector General's Office, from W. F. Lawless, "DOE Order 5820.1 (Management of Transuranic Contaminated Material) and draft DOE Order 5820, Radioactive Waste Management," August 27, 1983.	
	3. U.S. Department of Energy Order 5820.2, Radioactive Waste Management (1984).	
	4. Department of Energy Acting to Control Hazardous Waste at its Savannah River Nuclear Facilities, U.S. General Accounting Office report to the Honorable Ernest F. Hollings, United States Senate, Rep. GAO/RCED-85-23 (1984).	
	5. Final Environmental Impact Statement, L-Reactor Operation, Savannah River Plant, Aiken, SC, U.S. Department of Energy 3-Volume Rep. DOE/EIS-0108 (1984).	
	6. Environment Monitoring at the Savannah River Plant, Annual Report for 1982, Savannah River Plant Rep. DPSPU 83-302 (1984).	

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Comment number	Comment	Response
	7. Technical Summary of Groundwater Quality Protection Program at Savannah River Plant, Volume I, Site Geohydrology and Solid Hazardous Wastes, a Savannah River Plant Rep. DPST-83-928 (1983).	
	8. Final Environmental Impact Statement, Waste Management Operations, Savannah River Plant, Aiken, SC, U.S. Energy Research and Development Administration Rep. ERDA-1537 (1977).	
	9. Environmental Monitoring in the Vicinity of the Savannah River Plant, Annual Report for 1982, Savannah River Plant Rep. DPSPU 83-30-1 (ca. 1983).	
	10. An Airborne Radioactive Effluent Study at the Savannah River Plant, a U.S. Environmental Protection Agency Rep. 520/5-84-012 (1984).	
	11. W. F. Lawless, "General and Specific Comments," p. 91-95, Final Environmental Statement Related to the Operation of Vogtle Electric Generating Plant, Units 1 and 2, a U.S. Nuclear Regulatory Commission Rep. NUREG-1087 (1985).	
	12. Letter to C. Benge, Inspector, Department of Energy, Inspector General's Office, from W. F. Lawless, SRP Burial Ground Appraisal Report (BGAR)	
	13. W. F. Lawless, Savannah River Plant (SRP) Burial Ground, Building 643-G, Management Appraisal Report, Appraised June 2-13, 1980, a U.S. Department of Energy Savannah River Operations Office draft report (1982).	
	14. W. F. Lawless, K. G. Brown, Management Appraisal Report, Savannah River Plant (SRP) Tank Farm., a U.S. Department of Energy Savannah River Operations Office report (1981).	
	15. W. F. Lawless, K. G. Brown, B. M. Dodge, Performance Audit Questions, Savannah River Plant (SRP) Tank Farm, a U.S. Department of Energy Savannah River Operations Office draft report (1982).	

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Comment number	Comment	Response
	16. W. F. Lawless, The Savannah River Plant: Hazardous and Radioactive, Comments on a Panel's Review and Findings of Ongoing Health Effects and Epidemiological Studies of Operations at the Savannah River Plant (1985).	
	17. Environmental Monitoring at the Savannah River Plant, Annual Report for 1982, SRP Rep. DPSPU 82-302 (1984).	
	18. Letter to R. L. Morgan, Manager, DOE-Savannah River Operations Office, from W. F. Lawless, transmitting reference 16, February 8, 1985.	
	19. C. Nandrasy, DOE-Savannah River Public Relations Office, personal communication, February 8, 1985.	
	20. "The Lost Mercury at Oak Ridge," News and Comment, Science, 221, 130-132 (1983).	
	21. B. A. Fenimore, "Atomic Bombs, Chemical Wastes," Environment, 26, 2-3 (1984).	
	22. The 1984 Department of Energy response to Congressman Dingell.	

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	STATEMENT OF SHEPPARD N. MOORE Chief, NEPA Review Staff Environmental Protection Agency Region IV Atlanta, Georgia	
	My name is Sheppard N. Moore and I'm Chief of the NEPA Review Staff for Region IV, U.S. Environmental Protection Agency, Atlanta, Georgia. I'm presenting this statement on behalf of Jack E. Ravan, Regional Administrator. I also would like to state that Larry Neville of our General Counsel's Office is with me today. We're pleased at EPA to see the Department of Energy preparing an Environmental Impact Statement as part of the decision-making process concerning waste management activities at the Savannah River Plant. The Environmental Protection Agency has a long history of involvement with working with DOE in the State of South Carolina and we look forward to working with them during the preparation of this EIS. As many of you will recall, the issue of hazardous waste and groundwater management was raised on numerous occasions during the EIS process on the L-Reactor Restart, but was resolved through mitigation efforts with EPA, you, and the State. The EIS will provide a mechanism for thorough analysis of reasonable alternatives to manage the hazardous waste at SRP. The RCRA permitting procedures do apply to DOE and will be used to establish a Remedial Action Plan for waste management. I appreciate the opportunity to be here and my primary purpose in being here is to hear what the public has to say. Thank you.	Comments noted. No response on scoping required.

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Comment number	Comment	Response
	STATEMENT OF ARTHUR H. DEXTER 3033 Powderhouse Rd. Aiken, SC 29801 May 14, 1985 Comments at DOE Hearing - Aiken, SC The handouts that you recently sent me indicate a desire on the part of DOE to protect groundwater resources, human health, and the environment from any adverse effects of waste management activities. I too share these concerns and after reading the proposed scope of he EIS, I wondered if it shouldn't be expanded to include other concerns that - so far as I am aware - have not yet been addressed in an EIS. I would like to cite three such concerns for your consideration:	
D-1	1) Within the tank farm where 32-million gallons of high-level radioactive waste is stored, there are wells which draw water from the Tuscaloosa aquifer to cool these waste tanks. Several years ago, a new waste storage tank was inadvertently scheduled to be installed directly on top of an existing well. When the error was discovered, the tank was relocated 40 ft. from the well and the well was plugged with concrete. Knowledgeable people contend that this course of action was inappropriate, in that the shrinkage of the concrete plug during solidification will produce annualar voids, in spite of the best of precautions. *Should the adjacent waste tank leak or overflow there is a* real possibility for the flow of radioactive liquid directly into the Tuscaloosa aquifer. I would like to see this matter addressed in the EIS.	The purpose of the EIS, as announced in the Federal Register, is to assess the potential environmental effects of the modification of waste management activities for hazardous, low-level radioactive, and mixed wastes for the protection of groundwater, human health, and environment. High-level radioactive waste management activities have been described extensively in four previous environmental impact statements (ERDA-1537, DOE/EIS-0023, DOE/EIS-0062, and DOE/EIS-082), and are outside the scope of this EIS.
D-2	2) Within the waste-management facilities, there is an important waste-transfer line for high-level radioactive waste that is enclosed within another pipe, or shroud, so that, in the event of the rupture of the transfer line, the liquid would be contained within the shroud. It appeared that the shroud was breached several years ago when	See the response to comment D-1.

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	monitors revealed the in-leakage of water into the shroud subsequent to heavy rains. I should like to ask if this shroud has since been repaired or replaced and I should like to request that the EIS establish standards for the shut down of process equipment when the integrity of important protective devices is lost.	
D-3	3) It is said that radioactive materials have escaped through the expansion joints of the concrete floors of the canyon buildings. It is further said that this material is moving through the soil beneath the buildings. Does this problem come under waste management and should it be addressed in the EIS?	See the response to comment D-1.
	Thank you for the opportunity to voice these concerns.	
	Arthur H. Dexter 3033 Powderhouse Rd. Aiken, SC 29801	

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	STATEMENT OF BEATRICE JONES SCOPING MEETING SAVANNAH RIVER PLANT May 14, 1985	
E-1	Although I welcome the opportunity for comments at this scoping meeting in preparation of the DOE's EIS on waste management activities at the Savannah River Plant, I nevertheless find it regrettable that the NUS Corporation will be preparing the Environmental Impact Statement. Previous public criticism of their preparation of the DOE's EIS indicated their inefficiency with their lack of objectivity. It often appears that the NUS Corporation discovers what the Agency wants and then chooses what supports it. The signing by the NUS Corporation of a three year, $10.7 million contract with the Department of Energy indicates there has been no attempt to dispel public criticism.	A response to previous comments on the role of NUS Corporation in assisting DOE in the preparation of environmental impact statements was contained in Volume 3 of the Final Environmental Impact Statement, L-Reactor Operation, Savannah River Plant, Aiken, S.C. (DOE/EIS-0108) on pages M-35 and M-37. DOE is solely responsible for the preparation and contents of its environmental impact statements.
E-2	*The opening remarks of the* SRP Groundwater Protection Implementation Plan stated that SRP's monitoring and other activities "are the foundation of a broadly based environmental program which has consistently demonstrated the negligible environmental impact of the site's operations on the general public." Statements like this appear to be in conflict with the National Environmental Policy Act, which, according to the Calvert Cliff's Decision, has as one of its purposes, "...to advise other interested agencies and the public of the environmental consequences of planned federal action."	The statement in the SRP Groundwater Protection Implementation Plan was based on the monitoring and analysis of samples during operation of the SRP. The statement was not intended to be a conclusion on actions or activities to be considered in the EIS.
E-3	Anything that affects the environment affects the general public. There is little that is negligible at the Savannah River Plant. Over the years, the Savannah River Plant has built up tremendous amounts of contamination, some of which is being addressed. Nevertheless, the re-start of the L-Reactor, and new facilities yet to come on line, will add to the existing problems. *The D.O.E. has stated that there is no immediate* threat of any kind to the on- or off-site population. They have also stated in their April 1984 report that 82 monitoring wells have been drilled in the A/M area for management of the groundwater contaminated with volatile chlorocarbons. However,	Monitoring programs and studies related to the actions considered in the EIS are discussed in Chapter 5.

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	according to S.C.D.H.E.C., there are presently at least 160 monitoring wells in the area indicating the difficulty in following the plume of migration, and an increase of 78 or more wells in a year.	
E-4	In a report of June 22, 1970 by the U.S. Department of the Interior Geological Survey, it was stated, "Although monitoring wells are of value at the site of nuclear facilities, it must be remembered that the data obtained from the monitoring will not necessarily prove that radionuclides are not migrating from the site. (This, of course, would apply to volatile chlorocarbons or other contaminants, as well.) In other words, the absence of radionuclides (in this case, chlorocarbons) obtained from a monitoring system does not prove containment of radionuclides (or chlorocarbons) on-site. Because of the complexity in the flow patterns of groundwater, radionuclides (or other contaminants) contained in it could by-pass the monitoring wells, and not be detected until they have moved some distance from the site."	The bases for the prediction of groundwater transport of contaminants will be discussed in Appendixes A and H of the EIS.
E-5	It is for these reasons that the highly prioritized, highly contaminated A/M area is of particular concern to me, although I have not forgotten other areas. According to the Revised: April 4, 1984 SRP Groundwater Protection Implementation Plan, process water was discharged to Tims Branch and the M area settling basin from 1953-1982, a period of twenty-nine years. Tims Branch contained volatile chlorocarbons from seepage of the settling basin, spills and leaking underground process effluent piping which resulted in groundwater contamination. The chlorocarbons traveled down Tims Branch to Steeds Pond and may have migrated into the ground along the effluent route.	Programs underway for the remediation of chlorocarbon contamination of groundwater in the A/M-Area are discussed in Chapter 1, and the relationship of groundwater to surface hydrology will be discussed in Chapter 3 and Appendix A. Actions and activities in the A/M-Area that are not underway and that might be implemented are assessed in Chapter 4.
E-6	A possible explanation contrary to the DOE's "plant security" reason for their occupancy and control of the Forest Service Lands, comprising tracts 1 and 2--the Talatha Units which adjoin the SRP near the Administration Area--is that migration of the contaminated groundwater from the A/M area may be more extensive than previously known, and either off-site, or closer to the plant boundary than the DOE would care to admit. Dr. Joseph	As contained in the environmental assessment on the transfer of control of occupancy and use of lands adjacent to the SRP, the tracts of land were originally part of the Savannah River Plant and the sole consideration in transferring the control of the land was to improve the security posture of the SRP. Chapter 4 and Appendix F discuss the potential migration of groundwater contamination both on and off of the

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	Spencer who was the plant's technical supervisor in 1983, stated in April of that year that the Tuscaloosa aquifer flows toward Jackson, as well as New Ellenton and Talatha. Occupancy of the Talatha Units of USFS land may make it possible for the DOE to truthfully say that there has been no off-site migration of contamination. I believe there is considerable evidence that is supportive of my view. There may be a similar explanation for Tract 3, the Swamp Unit, which adjoins the western boundary of the SRP near the "D" area, heavy water area, and Equipment Test Facility.	SRP, including those tracts formerly controlled by the U.S. Forest Service.
E-7	With regard to the DOE's Environmental Impact Statement, most of all I would like to see in the EIS decision-making process how you have figured the cost of SRP waste management in terms of health effects, and/or the shortening of people's lives. I would like to know what monetary figure you have selected to represent the value of a person's life.	The potential health effects of alternatives and the methods used to evaluate health effects are presented in Sections 4.2, 4.3, 4.4, 4.7, and Appendix I. The methodology of assessing health effects does not assign a "cost" to health effects or shortening of people's lives; rather, it assesses the potential risk of increased incidences of cancer.
E-8	The public has the right to expect that this time you comply completely with RCRA, since it took a legal battle on the part of citizens' organizations to force the DOE to do what they should have been doing all along. Beatrice D. Jones	Chapter 6 discusses the applicable Federal and State regulatory requirements for the proposed modification of waste management activities at the SRP, including the requirements of the Resource Conservation and Recovery Act, as amended.

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Comment number	Comment	Response
	STATEMENT OF IRA DAVIS Richmond County Property Owners Association	
	Ladies and gentlemen, we are here today for two reasons. The first is to give these gentlemen the benefit of our thinking in connection with the up-coming EIS. The second is to hear and explanation from them of the measures which are planned and which will be put in motion when and if the EIS is approved by DOE Headquarters in Washington, D.C.	Comments noted. No response on scoping required.
	I think sometimes we are too slow to realize and appreciate the fact that ours is a government of, for and by the people of the country. In some other countries the thing would be done and we would be told about it after it was all over. In some other countries it would be done and, regardless of the risk we would not be told at all. Here, and only here, we are told up front what is contemplated and asked to contribute our thinking to the united effort to determine the danger to the environment and determine how to keep the risks to a minimum.	
	Almighty God, in his infinite wisdom placed all species on this earth to remain for a time and then, in the eternal plan and scheme of things to pass away and give room for other species to take their place. Man may be a part of this scheme - we do not know. We do know that we and we alone have the power to destroy the greater part of what we call our world. The question is if we have the wits to preserve it.	
	The best professionals in our country's service have contributed their special talents to determining the present and future dangers to the environment today, tomorrow, and as far in the future as man can see with any pretense of accuracy.	
	The purpose of the EIS, as I understand it, is to balance the risk against the gain, to determine what if any, other precautions need to be taken and, if so, how it should best be done. Fine! But when the first atomic bomb laid waste Hiroshima man was made a junior partner by God and given knowledge to enable him, if he is foolish, to destroy himself.	

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	No man, whether sitting in the Pentagon or here in this room, can say with certainty what the environmental results will be. But some of us know this, others can hazard a guess. Our way of life is threatened as never before by the forces of a Godless world that would utterly destroy us to ensure its own supremacy. The Russians looking down through the bomb sights on their Bears and Backfires care not what damage they do to the environment where their bombs fall. Their only care is can they destroy the war making potential of SRP quick enough and completely enough to prevent it furnishing our own Armed Forces with the means to take dreadful revenge for their fast strike. If they can, they will win and win the world with it. If they cannot, the cost will be 100,000,000 plus Russian casualties, most of them inside European Russia. Such losses would undoubtedly mean the end of the Communist system, regardless of the final outcome of the war. For make no mistake, ladies and gentlemen, the old saying is true - nobody ever started a fight he didn't think he could win. But, our starry eyed liberals say - and what makes them so awfully dangerous is the fact that most of them sincerely believe what they say - we already have enough warheads to blow up the world x number of times over. True, maybe. But some of those same warheads were made during the '50s and are beginning to lose their efficiency with age. They must be modified, rejuvenated or even replaced if we are to continue to be able to say to Moscow "Yes, you can kill us but the price of doing it is your own life." That is what is keeping an uneasy truce and has since 1950 - the certainty that our destruction would mean theirs as well. So let me close by saying this - nothing from George Washington risking the little band of ragged patriots in the middle of the Deleware of Christmas Eve to the outcome of the tests at Los Alamos which ended the bloodiest conflict in world history - nothing worth doing was ever done without RISK.	

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	Our task is to determine the degree of that risk, how to minimize it or avoid it and to go back to our own communities and squelch rumors that our great grandchildren will be born with horns in the middle of their foreheads from drinking radio active water caused by the discharge from SRP into our own Savannah River. The men who work daily with this dreadful power have as much to lose as we do - in some cases maybe more. None of them back away. We must know if we will have clean water and fresh clean air. We cannot survive without them. But if some sub-species has reached the end of its allotted time in God's great scheme of things it dies so that free men can live in progress, sleep at night in their beds in peace and pass a better world on to their children - then men themselves have died, gladly, for the same reasons. Nuclear power for peace could be the greatest boon to mankind since the invention of fire. Nuclear power for war could destroy us. If we are to join other bygone nations on the scrapheap of history let no man be able to say, truthfully, that they met their fate because of an unwillingness to fight and die for what they believed in. Nor let them be able to say that our fate overtook us because, like ostriches we stuck our heads in the sand and waited for the danger to pass. I quote the Father of our Country, who saw us through our birth and childhood. George Washington said "The best way to insure peace is to remain ever prepared to defend it. Let us prove, to ourselves, to our grand children who, terrified by false rumors and blinded by meaningless platitudes, wail "better Red than Dead," that we mean to be neither. If there are risks let us use our science to minimize them - then take them. And ending to the time of testing, quibbling and indecision is upon us. The time for action is upon us. Let us build and strengthen ourselves so that we can say - and make it stick - "come the three other corners of the world in arms against us we shall shock them. AND NAUGHT SHALL MAKE US RUE, IF THIS LAND TO ITSELF DOES REMAIN BUT TRUE."	

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Comment number	Comment	Response
	Thank you. Ira Davis Jr. Pres. R.C.P.O.A P. O. Box 5631 Augusta, GA 30906	

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Comment number	Comment	Response
	STATEMENT OF GENE WEEKS Speaking for Judith E. Gordon, Ph.D. Nuclear Issues Coordinator South Carolina Chapter Sierra Club	
	SIERRA CLUB SOUTH CAROLINA CHAPTER	
	TO: DOE Officials, Scoping Meeting for EIS on Waste Management at SRP.	
	FROM: Judith E. Gordon, PhD, Nuclear Issues Coordinator, South Carolina Chapter, Sierra Club	
	Re: Comments on proposed EIS.	
	The South Carolina Chapter wishes to express its appreciation for the opportunity to present comments on waste management activities and procedures at the Savannah River Plant (SRP). I'm sure we can agree that the Department of Energy's willingness to write an environmental impact statement (EIS), without "outside" coercion, is going to save all of us time and energy, so to speak.	
G-1	Attached to this statement is a more detailed fact sheet that outlines the Sierra Club's position on the treatment of low-level nuclear waste. In the interest of brevity, this will not be read now but instead entered as part of the record of this hearing. Our main concerns are outlined as follows.	Comments in fact sheet noted. The EIS discusses alternatives for the disposal of hazardous, low-level radioactive, and mixed waste, including above-ground disposal facilities in Chapters 2 and 4.
	The Environmental Protection Agency (EPA) has stated that groundwater contamination is a growing problem in the U.S. It has led to the closing of private and public wells in at least 25 states. One of the major sources of contamination is surface impoundments. While EPA is, of course, speaking of commercial facilities, we have seen similar contamination occur at SRP with the movement of trichloro- and perchloroethylenes into the Tuscaloosa Aquifer from seepage basins at the SRP. Had DOE officials been asked about the possibility of such leakage ten years ago, they would have assured the public that it was such	

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	a remote possibility that it wasn't worth a second thought.	
G-2	Today there are plenty of second thoughts - how well do we really understand the hydrology of this region? Are seepage basins AND shallow-trench burial, for that matter, really the best way to handle either hazardous or low-level radioactive waste? It is becoming obvious that the answers and possible solutions are far more complex than technocrats ever envisioned. Worldwatch Institute's paper on water management (Water: Rethinking Management in an Age of Scarcity, #61, Dec. 84) emphasizes the seriousness of the contamination problem, be it commercial or defense in origin. "As much as a fourth of the world's water supply could be rendered unsafe for use by the year 2000." We in the Sierra Club feel that government operations have a unique opportunity, if not a responsibility, to demonstrate to all concerned that the proper handling of waste can prevent future catastrophes. Indeed SRP now has such an opportunity to correct many of its past errors.	Chapter 3 and Appendixes A and H discuss the geology and subsurface hydrology at the SRP, as well as geohydrological modeling used to assess the alternatives in the EIS. Also see the response to comment G-1.
	Along these lines, we assume that DOE officials will want to	
G-3	1. Conform to all state and national regulations that currently apply to disposal of commercial hazardous and low-level radioactive wastes. This includes compliance with the Resource Conservation and Recovery Act (RCRA) as directed by the court decision (LEAF v. Hodel, No. 3-83-562, E.D. Tenn. 1984) stating that federal defense facility "mixed" wastes are also subject to RCRA regulations.	Chapter 6 discusses the applicable Federal and State regulatory requirements for the proposed modification of waste management activities at the SRP, including the requirements of the Resource Conservation and Recovery Act, as amended, and the status and applicability of "mixed waste" regulations.
G-4	2. Consider greatly increase use of above-ground storage of hazardous and low-level radioactive waste, especially in view of the dismal record of such sites as Maxey Flats, KY, and Sheffield, IL where so-called safe trenches leaked prematurely and had to be permanently closed. The climate and hydrology of the Eastern U.S. do not lend themselves well to trench disposal of waste. EPA has stated that half of all commercial sites are located over thin or permeable unsaturated zones; that over 70% lack proper lining; that nearly one third of all sites are within a mile of a water well that could be affected by contamination. How much of this applies to defense waste disposal sites at SRP?	See the response to comment G-1.

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G-5	3. Support new regulations that redefine low-level waste so that, for example, radionuclides that require more than 100 years of monitoring are treated as high-level waste and handled separately.	The development and support of new regulations are not within the scope of this EIS.
G-6	4. Consider all state-of-the-art disposal methods and make choices on criteria that first emphasize sufficient isolation and safety and then consider costs. We have seen what short-term savings have produced - ineffective trench burial and leaking seepage basins!	See the response to comment G-1.
G-7	5. Permit effective outside monitoring so that the public can have some faith that things are really working as they should.	Chapter 5 discusses groundwater monitoring activities at the SRP, including the relationship of monitoring activities to State and EPA requirements.
G-8	6. Admit that in view of past problems, the SRP site is not well suited to waste burial, and perhaps another production reactor is not in the best interests of anyone save those whose jobs are tied to SRP. This is by no means a statement that jobs are not an important consideration, but that the health and welfare of the people of this area are more important. DOE should seriously consider job retraining and location for those who may need it if and when the SRP facilities are no longer needed. We are sure you will want to meet these challenges in creative ways and in the best interests of all concerned. Thank you.	See the responses to comments G-1, G-2, and G-3. The subject of a new production reactor is outside the scope of this EIS.

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	ATTACHMENT SIERRA CLUB Radioactive Waste Campaign Fact Sheet "Low-Level" Nuclear Waste: Options for Storage Legislators, policy makers and citizens are rushing to meet a deadline of January 1986 set by the U.S. Congress (Low-Level Radioactive Waste Policy Act) when regional solutions to the "low-level" nuclear waste problem must be in place. The imminence of this unrealistic deadline has forced decision makers to opt for the quick fix, disposing of all "low-level" waste in burial grounds. Burial grounds differ little from garbage-type landfills. Waste generators believe landfills can somehow be made to work. But they are not a viable option. In moist areas, water runoff and underground migration inevitably bring water into a landfill and carry out poisonous chemical and radioactive substances. Waste generators and the Nuclear Regulatory Commission (NRC) consider all "low-level" waste the same. But it is not. Some is extremely radioactive and long-lived, requiring monitoring and maintenance for thousand of years; other waste is slightly contaminated and short-lived. These "low-level" waste streams should not be "disposed of" in the same place, using the same basic technology - shallow landfills. A sound "low-level" waste management policy calls for segregating radioactive waste at the point of generation and storing it above-ground. While the waste is stored above-ground, we can be assured of no leakage into our ground water. The waste can be easily monitored and protected. Short-lived waste will decay to non-toxic levels.	

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	THE WASTE STREAM MUST BE SEGREGATED AT THE POINT OF GENERATION Each of the different types of "low-level" waste have specific characteristics and require specific storage techniques. REACTOR WASTE, which accounts for 24% of the radioactivity of "low-level" waste sent to burial grounds[1], falls into two radically different categories. Wet waste which consists of ion exchange resins and sludges, and dry waste which consists of clothing, rags and tools. By volume, power reactors account for about 54% of the waste stream. WET WASTE Resins and irradiated components, such as control rods, make up over 95% of the radioactivity in reactor "low-level" waste.[1] The nuclear industry tends to talk only in terms of volume when discussing "low-level" waste. This is misleading. The radioactivity, longevity and chemical composition of the material must be an integral part of a sound waste management policy. Resins are a media with the consistency of caviar. They are used to purify the water that circulates around the fuel in the reactor. Of particular concern is cesium-137, which is water soluble, and therefore, readily migrates out of the nuclear fuel into the surrounding cooling water. Because of this solubility, the substance will also readily migrate out of a burial ground. An average reactor produces 500 curies* of cesium-137 per year.[12] with 80 operating nuclear power plants in the U.S., about 40,000 curies of cesium-137 are shipped to burial grounds each year. Besides cesium-137, another dominant component of reactor wet waste is cobalt-60. These two isotopes have half-lives,* respectively, of 30 and 5 years and must be sequestered from the environment for at least 300 and 50 years, respectively. These wet wastes, because of their toxicity, longevity and mobility in the case of the cesium-137, should not be dumped in landfills. They should be temporarily stored in bunkers, preferably above-ground, carefully monitored and subsequently, isolated in a high-level waste repository, when one is available. *see glossary.	

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	DRY WASTES These are generally only slightly contaminated materials that can be compacted: Some of these materials conceivably could be incinerated because the radioactivity could be trapped on filters as in done in Canada (see page 4). The difficulty with incinerating the dry wastes of the nuclear reactor "low-level" waste stream is that, if an incinerator were operating, nuclear utilities would press to also have the resins and sludges incinerated. This would pose an unacceptable health hazard to surrounding communities because of the large amounts of cesium and other isotopes going up the stack, material which could not be entirely trapped on stack filters. If not incinerated, the dry wastes of a reactor should be compacted and stored in bunkers. IS IT FEASIBLE? Can the wet waste stream be separated from the dry waste steam at the reactor? Yes, it is already being divided prior to transport. Because of high radiation levels of resins, these materials are currently transported in shipping containers separate from the steel drums and wooden crates used for dry wastes. Current practice is that, in these separate shipping containers the wet and dry wastes are sent to the same burial grounds, and buried together. This segregation, initiated at the reactor for transport purposes should be used for storage purposes as well, as is done in Canada[3] (see page 4). INDUSTRIAL WASTE These account for 73% of the radioactivity of the "low-level" waste going to burial sites.[1] In this category fall two large producers of isotopes for medical and research purposes: New England Nuclear (MA) and Union Carbide (NY) which, respectively, account for 24% and 15% of the total radioactivity of the nation's "low-level" waste. New England Nuclear's waste is primarily tritium, producing 120,000 curies per year. Since tritium behaves exactly like water, it cannot be isolated in a landfill. This waste should be stored in above-ground bunkers for at least 100 years. Union Carbide's waste consists of all the radionuclides represented in irradiated fuel. By no stretch of the imagination can this waste, which is dominated by the long-lived	

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	isotopes such as strontium-90 and cesium-137, be classified as "low-level." This is waste, which along with the resins and sludges from reactors, should be isolated in above-ground storage bunkers, temporarily (20-50 years) and then moved to a high-level waste repository. By volume, industrial waste accounts for about 11% of the total stream. INSTITUTIONAL WASTE, which accounts for about one-third of the volume of waste presently going to commercial burial grounds, consists of materials both from hospitals and research institutions. These two waste streams are significantly different from one another with medical waste dominated by short-lived materials such as technetium-99m with a half-life of six hours and the research waste stream consisting of long-lived materials such as carbon-14 and tritium with half-lives, respectively, of 5,000 and 12 years. Other shorter-lived materials are also included in institutional waste. The medical waste, with less than one percent of the radioactivity in "low-level" waste, lends itself to being stored in above-ground facilities for about three years until it has decayed to levels low enough to be disposed of as regular trash. Dartmouth College has a program (described in detail on page 4) which offers considerable promise for similar institutions. Hospitals in cities should follow Dartmouth's example by using a centralized storage location for isotopes for the necessary decay period. LANDFILLS LEAK An erroneous assumption dominating current "low-level" waste planning is that landfills can be prevented from leaking. The history of both radioactive and chemical landfills in humid climates does not substantiate this claim. The unlined dump, and even the double liner approach, using a leachate* collection system, have failed in areas of average rainfall (30-40 inches per year). Experts, such as Dr. Peter Montague at Princeton University, Center for Energy and Environmental Studies have stated.	

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"We found that four state-of-the-art landfills in New Jersey developed leaks within one year. I think the whole idea of secure landfills is really a figment of optimistic imaginations."

The track record of radioactive landfills in humid areas, has similarly been poor (see box 1). Of six commercial sites which have operated in the United States, three are now closed because of problems: Maxey Flats, Kentucky; West Valley, New York; and Sheffield, Illinois. All three have had water infiltration into trenches, slumpage of trench covers and erosion. At each site, radioactivity has migrated and expensive remedial actions are continuing. The major operating radioactive landfill for the country, Barnwell, South Carolina, is located in a high rainfall area. It has not had buildup of radioactive leachate because of the porous, sandy trench bottom which allows radioactive water to drain out into the environment. Tritium has been detected 45 feet from the burial trenches at Barnwell. The other operating sites, in Beatty, Nevada and Richland, Washington, both located in semi-arid regions, have apparently not had the same problems as at other sites.

Leaking radioactive landfills are not acceptable to the general public. The definition of a "safe" level of radiation has changed drastically over time as we have learned more about radiation and human health. Most physicians agree now that it is the accumulation of low-level radiation doses which is hazardous. We still do not know the exact dose which causes cancer, though we do know that there is a direct correlation between the amount of radiation received by humans and the incidence of cancer.[4]

ABOVE-GROUND STORAGE IS PREFERABLE

Above-ground storage avoids the health hazard of leaky burial grounds and avoids the high cost associated with remedial action that, inevitably, will be required at failed burial grounds. Above-ground structures permit storage in a facility that can be easily repaired. While, over time, concrete may deteriorate, cracks may develop, or operational error may cause leakage, problems can be quickly detected and remedied. Above-ground

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	structures can be designed in such a way as to provide a double barrier which can be used to isolate leakage and prevent it from moving into ground water. The nuclear industry and its boosters have fabricated a number of disadvantages to above-ground storage: cost, nonpermanence, reliance on institutional controls, sabotage, even plan crashes. Many of these arguments, discussed in box 2, are simply red herrings. The industry, in advocating radioactive landfills, is promoting an "out-of-sight, out-of-mind" solution. But as the operating record at three closed sites has made one point abundantly clear: RESIDENTS AND TAXPAYERS ALWAYS PAY IN THE END FOR LEAKY LANDFILLS. ABOVE-GROUND STORAGE IS PRACTICAL AND FEASIBLE Above-ground structures are being used by utilities operating power reactors in the United States and Canada,[3] and by medical and research institutions. The Tennessee Valley Authority (TVA) has built above-ground storage modules at the Sequoyah Nuclear Plant near Chattanooga, Tennessee.[2] Several utilities in the Northeast are designing and building on-site, above-ground storage facilities. Vermont Yankee in Vermont, Pilgrim I in Massachusetts and Susquehanna in Pennsylvania are all moving in this direction. TVA ABOVE-GROUND STORAGE Presently, the TVA ships "low-level" radioactive waste to the Barnwell, South Carolina landfill. Because of the near-term uncertainty of space at Barnwell, the NRC approved and TVA has partially constructed an above-ground storage facility at the two Sequoyah nuclear reactors located on the Tennessee River, 18 miles northeast of Chattanooga. The TVA above-ground storage facilities are not much more complicated than a large concrete box, called a module, with special features to collect radioactive leakage and to shield workers.	

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	The storage modules are constructed, as needed, of reinforced concrete with an inner decontaminable coating. The modules are large, rectangular boxes, 34' wide, 195' long and 19-1/2' high. The thickness of the concrete floor slab is 39-1/2", while that of the caps and walls is 24". Modules for the storage of resins are almost twice as thick - 42". According to TVA plans, eight resin storage modules and five trash modules will be located on a 20-acre area. There are four compartments in each module. Each compartment contains a liquid drainage system and sampling valves. Any radioactive liquids can be collected and repackaged, or taken to the nuclear plant for processing. Filters and booties that are less radioactive are stored in 18-gauge, steel drums or boxes. The more radioactive exchange resins are stored in more rugged carbon steel cylinders coated with epoxy. A giant mobile crane straddles the entire concrete module, running along curbed concrete sidewalks on each side of the module. Module loading/unloading steps, through use of the rubber-tired, diesel-powered gantry crane, are shown in box 2. The highest radiation doses are received by crane operators, though the concrete shielding reduces the levels. Since the storage facility is located about 200' from the site boundary, the doses to the public were expected to exceed the NRC hourly radiation limits while the cover is off the storage module. Above-ground storage units can be located so that public exposure is not necessary. The above-ground storage facility is of substantial construction and is expected to remain functional for several decades. The NRC will, however, only license above-ground storage facilities for a five-year period. This limit will need to be extended for the above-ground storage to be implemented. The NRC has no technical justifications for this limit. ONTARIO HYDRO EXPERIENCE Ontario Hydro operates eight nuclear reactors with a total capacity of 5,100 MW(e), with an additional eight reactors under construction.[3] The Canadian reactors, called CANDU reactors,	

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	are different than U.S. reactors which must be shut down for refueling every 12 to 18 months. The CANDU reactors are fueled while the reactor is operating. Defective fuel leaks radioactivity into the cooling water. In the CANDU reactors, this fuel can be promptly replaced. This means the CANDU generates about one-half of the "low-level" waste that U.S. reactors produce for the same electrical output. In the Ontario Hydro system, there are four reactors at each site. A central storage area, the Waste Operations Site, located at the Bruce pant near Tiverton, Ontario, will service all 16 Ontario Hydro reactors. At each reactor site, the resins are slurried into large (three cubic feet) carbon steel cylinders. These sit upright in shipping containers and are sent to Bruce for storage. These resins, along with water purification filters, are stored either in tile holes or Quadricells. The tile holes are located underground; they are cylindrical, concrete storage containers, each of which holds two ion exchange resins. After loading, the containers are backfilled with concrete. A leachate collection system and monitoring system are utilized at the bottom of the tile holes. As part of Ontario Hydro's waste management plan, when the resins and filters have cooled to the point where radiation levels are less than one rem per hour, the cylindrical container and concrete backfill will be lifted in one piece and transported to an above-ground storage building (see photo page 5). Resins are also stored in Quadricells, heavy concrete vessels which are placed in an above-ground concrete room 8' by 8' at its base, and 18' high , similar to a cemetery mausoleum. The roof is sloped to aid water runoff. The walls and floors are 2' thick, and, with the inner concrete cylinders, sufficient to shield workers and to withstand impacts from airplane crash, or tornado-borne utility poles. Fifteen Quadricells are placed in an area about 20' wide by 272' in length. The minimum design life is 50 years.	

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	The Ontario Hydro system for storing resins is clearly far superior to the U.S. system in which these radioactive, water soluble materials are dumped in leaky landfills. Also in use by Ontario Hydro are inground concrete trenches. These are for dry waste which is compacted and non-combustible and for radioactive ash that is generated by incineration of slightly contaminated materials such as clothing and papers. These concrete trenches are 10' wide, 10' deep and 125' long. The concrete lid is one foot thick; the trench walls are somewhat thicker. The trench slopes to a sump and standpipe which allows for water detection and removal. The above-ground storage building in the Ontario Hydro system is for wastes with radiation levels of less than one rem per hour. Both resins and lower-level wastes in the concrete trenches will eventually be stored here. This building is a prefabricated concrete warehouse with walls 1-1/4' thick and a concrete roof 1/2' thick. The building dimensions are 164' long by 98' wide by 26' high. The building has smoke detection equipment, carbon dioxide fire extinguishers and an internal drainage system. DARTMOUTH COLLEGE Dartmouth College in Hanover, New Hampshire produces "low-level" radioactive waste in medical and scientific research and at the College hospital.[5] In the past, this waste was shipped to commercial radioactive landfills in Richland, Wash. and Barnwell, S.C. While the volume produced between 1977 and 1982 remained stable (120 to 150 55-gallon drums per year), the cost of disposal increased by a factor of seven in this five year period. Like most medical and research institutions, the radioactive waste can be placed into five categories: liquid, solid, liquid scintillations vials (LSV), animal carcasses and other. For liquids containing less than 100 microcuries per liter of radioactivity, this waste, containing tritium and iodine-125, is disposed of into the sewer. Liquids containing more than 100 microcuries per liter are stored in one-gallon containers within a lined 30-gallon drum. This waste is primarily iodine-125	

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	(half-life: 60 days) and phosphorus-32 (half-life: 14.3 days), and is stored for ten half-lives. Solid waste, consisting of disposable plastic and glass items, and contaminated paper, is placed in a lined 55-gallon steel drum and compacted to reduce the volume. A drum typically contains a few millicuries of tritium, sulfur-35, chromium-51 and iodine-125, and is stored for at least ten half-lives, or approximately 2.4 years. After this storage period, 55-gallon drums containing less than a millicurie of tritium, will be disposed of as regular trash. Glass and plastic liquid scintillation vials are put into a lined 55-gallon drum for temporary storage. A shredder-crusher is used to separate the liquid, containing tritium, carbon-14, phosphorus-32, sulfur-35 and iodine-125, from the plastic and glass. Vials containing shorter-lived radionuclides are separated from those with tritium and carbon-14, and are stored for ten half-lives. The vials containing tritium and carbon-14 below minimum NRC levels and are disposed of as regular trash. Carcasses, mainly rats, are first stored in a cooler. If the carcasses contain iodine-125, they are placed in a freezer for sufficient decay (5 to 10 half-lives). Carcasses containing minute amounts of tritium and carbon-14 are incinerated. Other waste from special experiments may contain up to one to three curies of tritium. This waste, managed on a case-by-case basis, is packed separately and shipped to a commercial burial site. Based on the production rate of radioactive waste and the management methods mentioned above, Dartmouth College built a storage building capable of holding 240 drums, with expansion space for future needs. The storage building is a reinforced concrete structure 24' wide, 98' long and about 11' high. the walls are one-foot thick, insulated and faced with a brick veneer. To collect leakage, the floor slopes toward the center where a collection pit is located. With the doors set four inches above floor level, the room will hold about 800 gallons	

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	of fire water. A telephone and fire alarm pull station provide added safety and the building is equipped with heat detectors. The cost of the whole building, 2/5 of which is used for waste storage, was $125,000. Dartmouth estimates that the yearly cost of the storage facility, including operating and equipment costs, are less than the disposal costs at a radioactive landfill. As a result of this waste storage program and the short-lived nature of medical and research wastes, almost no radioactive waste is shipped to a radioactive landfill. CONCLUSIONS These examples of above-ground storage show that the technology is available. Above-ground storage will be resisted by utilities because of higher initial costs and because it will require the utility to maintain long-term responsibility for the wastes, rather than thrusting the long-term responsibility off on an unsuspecting state and its taxpayers. Some of the questions that need to be resolved are how many above-ground storage sites should be developed? Should these be at the reactor sites? What should be the design life of these facilities? Should above-ground storage operate in tandem with an incineration facility strictly limited to reactor dry wastes? It is clear that further research needs to be done on these questions. It is also clear that utilities and state governments must break off their love affair with out-of-sight, out-of-mind shallow landfill "solutions." It is time to re-think the "low-level" waste problem.	

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FOOTNOTES

[1]Department of Energy, Spent Fuel and Radioactive Waste Inventories, Projections and Characteristics, DOE/NE-0017/2, Washington, D.C., September, 1983.

[2]Nuclear Regulatory Commission, Environmental Impact Appraisal and Safety Evaluation Report of Low-Level Radioactive Waste Storage at Tennessee Valley Authority, Sequoyah Nuclear Plant, Docket No. 30-19101, Washington, D.C., September, 1982.

[3]Carter, T.J., "Radioactive Waste Management Practices at a Large Canadian Electric Utility," In Seminar in Management of Radioactive Waste from Nuclear Power Plants, Karsruhe, West Germany, 5-9 October, 1981, International Atomic Energy Agency, Vienna, Austria 1982.

[4]National Academy of Sciences, BEIR Report, Washington, D.C.

[5]Schori, E., "Disposal of Low-Level Radioactive Waste," Presented at League of Women Voters Conference on Low-Level Radioactive Waste, Boston, Mass., November 1983.

GLOSSARY

Leachate - The soluble components from waste which leak from a landfill when rain percolates through the trenches. This polluted liquid is called leachate.

Curies - A unit which measures radioactivity equivalent to 37 billion disintegrations per second.

Half-life - A period of time required for the disintegration of half of the atoms in a radioactive material.

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	STATEMENT OF MS. DORCAS J. ELLEDGE	
	I live in Columbia, South Carolina. I am a native South Carolinian and have been concerned for some time about the environmental quality that we are presently living in and what we are leaving...living...leaving future generations. I'm real glad that the Federal Government finally decided that the SRP was not the fifty-first state, but is a part of the State of South Carolina, which is a part of the United States of America. I wondered for sometime when they would come to that decision. I attended the hearings on the L-Reactor, and I was disappointed the DOE decided not to come up with the best solution to the problem concerning Steel Creek and the cooling towers. They had a choice, but due to time, so they said, and money, not the best solution did they do. This was a disappointment. I hope and pray that DOE, with the encouragement and insistence of EPA, will get the best solution to the problems of groundwater... possible groundwater contamination, and that already contaminated, for the Savannah River Plant. I think it's time that the health and safety of South Carolinians and, in this case, Georgians, too, take priority over time and costs. There comes a time of reckoning. Potable water is essential to life. You can't live without it. No living thing can. So, I hope this will be a consideration, and the first consideration of DOE and EPA, who will be working with them. We are South Carolinians who have been, really, put upon, maybe by our own will, ignorance, whatever you want to call it, but I would find it reprehensible if DOE compromised the health and safety of the people of South Carolina on this issue of groundwater contamination. I am not a scientist. I have, for thirty years, been a nurse, and dealt with health and sickness and death. Please do what is best in the interest of health and safety for the citizens of South Carolina, and I appreciate this opportunity to speak with you.	Comments noted. No response on scoping required.